Application No. 10/788,635
Inventors: Eric E. Kuo, et al.
Application Filed: February 27, 2004
Response to Office Action mailed March 5, 2009

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.   (Currently Amended) A computer implemented method , comprising:

~~providing~~ storing in a database data or information related to ~~comprising a compendium of~~ at least one of patient treatment history[[;]], an orthodontic therapy ~~therapies~~, orthodontic information , ~~and~~ diagnostics , or orthodontic treatment outcome; and

~~employing a data mining technique for~~ interrogating said database to generate ~~for generating~~ an output data stream~~, the output data stream~~ correlating a patient malocclusion with an orthodontic treatment parameter, interrogating said database including iteratively determining one or more statistically relevant patterns of different orthodontic related treatment outcome based comparable malocclusions and the respective orthodontic therapy.; ~~and~~

~~applying the output data stream to improve a dental appliance or a dental appliance usage.~~

associating said output data stream in said database with said malocclusion and storing the associated output data stream in said database.

2.   (Currently Amended) The method of claim 1, further comprising generating one or more data sets associated with one or more parameters of a plurality of appliances having geometries selected to progressively reposition the teeth, wherein the appliances comprise polymeric shells having cavities and wherein the cavities of successive shells have different geometries shaped to receive and resiliently reposition teeth from one arrangement to a successive arrangement.

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3.   (Currently Amended) The method of claim 2, wherein the plurality ~~sequence~~ of appliances includes a sequence of configurations of braces, the braces including brackets and archwires.

4.   (Currently Amended) The method of claim 2, wherein the plurality ~~sequence~~ of appliances includes a sequence of polymeric shells manufactured by fitting polymeric sheets over positive models corresponding to the teeth of the patient.

5.   (Currently Amended) The method of claim 2 ~~1~~, wherein the plurality ~~sequence~~ of appliances includes a sequence of polymeric shells manufactured ~~by stereo lithography from~~ using digital models

6.   (Currently Amended) The method of claim 1, wherein the output data stream is related to one or more clinical constraints.

7.   (Currently Amended) The method of claim 6, wherein the one or more clinical constraints includes one of more of a maximum rate of displacement of a tooth, a maximum force on a tooth, ~~and~~ a desired end position of a tooth, or one or more combinations thereof.

8.   (Original) The method of claim 7, wherein the maximum force is a linear force or a torsional force.

9.   (Currently Amended) The method of claim 7, wherein the maximum rate of displacement is a linear or an angular rate of displacement.

10.   Cancelled.

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11.   Cancelled.

12.   Cancelled.

13.   (Currently Amended) The method of claim 2 ~~1~~, wherein <u>one of</u> the <u>plurality</u> ~~last of the sequence~~ of appliances is a positioner for finishing and maintaining teeth positions.

14.   (Currently Amended) The method of claim 2 ~~1~~, further comprising:

        comparing an actual effect of the <u>plurality of</u> appliances with an intended effect of the <u>plurality of</u> appliances; and

        identifying <u>one of the plurality of</u> ~~an~~ appliance<u>s</u> as an unsatisfactory appliance if the actual effect of <u>one of the plurality of</u> the appliance<u>s</u> is more than a threshold different from the intended effect of the <u>plurality of</u> appliance<u>s</u> ~~and modifying a model of the unsatisfactory appliance according to the results of the comparison~~.

15.   (Original) The method of claim 1, further comprising capturing at least an initial tooth position, a target tooth position; and one or more intermediate tooth positions.

16.   (Currently Amended) The method of claim 1, further comprising analyzing one of <u>a plurality of</u> ~~the~~ intermediate tooth positions with <u>a</u> ~~the~~ target position.

17.   (Currently Amended) The method of claim 1, further comprising capturing <u>one or more</u> characteristics <u>data</u> tags associated with a patient case to label captured data.

18.   (Currently Amended) The method of claim 17, further comprising aggregating data of a set of treatments based on <u>the data</u> ~~their~~ tags and rating <u>at least one of a plurality of</u> the set of treatments based on the aggregated data.

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19.　(Original) The method of claim 18, further comprising comparing performance of a plurality of sets of treatments.

20.　(Currently Amended) The method of claim 1, further comprising applying a predetermined treatment models to calculate risk of treatment complications for individual patients.

21.　Cancelled.

22.　(Original) The method of claim 20, further comprising identifying a treatment case for special treatment parameters including clinical constraint.

23.　(Currently Amended) The method of claim 20, further comprising clusterizing a plurality of clinical practitioners based on one or more by practice habits.

24.　(Original) The method of claim 23, wherein treatment parameters are adapted to preferences specific to each cluster.

25.　(Currently Amended) The method of claim 1, further comprising applying a probabilistic models to determine one or more predict discrepancies between a targeted and an actual tooth position at one or more given stages in the treatment, and where said predictions are calculated into treatment plans.

26.　(New) A computer implemented method, comprising:

　　　receiving one or more parameters associated with a current malocclusion condition of a patient;

　　　accessing a database including stored information related to one or more of a patient treatment history, an orthodontic therapy, orthodontic information, diagnostics, or

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orthodontic treatment outcome, wherein a clustering operation has been or is performed on the accessed information from the database to detect one or more patterns in the accessed information, the one or more patterns associated with one or more treatment outcome or a predetermined level of treatment complication;

associating a predefined risk parameter to each detected one or more patterns based on the clustering operation;

generating an orthodontic related treatment information for the current malocclusion condition of the patient; and

outputting the generated orthodontic related treatment information to a display device.

27. (New) The method of claim 26, wherein the clustering operation is iteratively performed, each iteration of the clustering operation updating the detected one or more patterns.

28. (New) The method of claim 26, wherein performing the clustering operation includes iteratively detecting the one or more patterns and updating the associated predefined risk parameter based on each iteratively detected one or more patterns.

29. (New) An apparatus, comprising:

one or more processors; and

a memory for storing instructions which, when executed by the one or more processors, causes the one or more processors to access a database including stored information related to one or more of a patient treatment history, an orthodontic therapy, orthodontic information, diagnostics, or orthodontic treatment outcome based at least in part on a received current malocclusion condition of a patient, to perform a clustering operation on the accessed information from the database to detect one or more patterns in the accessed information, the one or more patterns associated with one or more

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treatment outcome or a predetermined level of treatment complication, to associate a predefined risk parameter to each detected one or more patterns based on the clustering operation, and to generate orthodontic related treatment information for the current malocclusion condition of the patient.

30.   (New) The apparatus of claims 29 including a display device operatively coupled to the one or more processors, wherein the memory for storing instructions, which, when executed by the one or more processors, causes the one or more processors to display the generated orthodontic related treatment information on the display device.